

CLAIMS

What is claimed is:

- 1 1. An extended wear chain comprising:
2 a chain component; and
3 a coating on said component including one or more of zirconium,
4 titanium, a zirconium compound, and a titanium compound.
- 1 2. The extended wear chain of claim 1, wherein said coating forms
2 a metallurgical bond with said component.
- 1 3. The extended wear chain of claim 2, wherein said metallurgical
2 bond is formed by said coating being at least slightly implanted into a surface
3 of said component.
- 1 4. The extended wear chain of claim 1, wherein said chain is
2 adapted for cutting a substance.
- 1 5. The extended wear chain of claim 1, wherein said coating
2 includes zirconium nitride.
- 1 6. The extended wear chain of claim 1, wherein said coating
2 includes titanium nitride.
- 1 7. The extended wear chain of claim 1, wherein said coating forms
2 a layer on said component less than or equal to 12 microns thick.
- 1 8. The extended wear chain of claim 1, wherein said chain
2 component is a cutter.
- 1 9. An extended wear chain comprising:

2 a chain component; and
3 a coating on said component including one of zirconium nitride and
4 titanium nitride.

1 10. The extended wear chain of claim 1, wherein said coating forms
2 a metallurgical bond with said component.

1 11. The extended wear chain of claim 10, wherein said metallurgical
2 bond is formed by said coating being at least slightly implanted into a surface
3 of said component.

1 12. The extended wear chain of claim 1, wherein said chain is
2 adapted for cutting a substance.

1 13. The extended wear chain of claim 1, wherein said chain
2 component is a cutter.

1 14. A chainsaw chain comprising:
2 a plurality of cutters;
3 means for connecting said plurality of cutters; and
4 a coating on each of said plurality of cutters including one or more of
5 zirconium, titanium, a zirconium compound, and a titanium
6 compound.

1 15. The chain of claim 14, wherein said coating forms a
2 metallurgical bond with said cutter.

1 16. The chain of claim 15, wherein said metallurgical bond is formed
2 by said coating being at least slightly implanted into a surface of said cutter.

3 17. The chain of claim 14, wherein said means for connecting said
4 plurality of cutters is coated with one or more of zirconium, titanium, a
5 zirconium compound, and a titanium compound.

6 18. The chain of claim 17, wherein said means for connecting said
7 plurality of cutters is one or more of a tie strap, a pre-set tie strap, a drive link,
8 and a depth gage.

1 19. A chainsaw comprising:
2 an extended wear chain including:
3 a chain component; and
4 a coating on said component having one or more of zirconium,
5 titanium, a zirconium compound, and a titanium
6 compound.

1 20. The chainsaw of claim 19, wherein said coating forms a
2 metallurgical bond with said component.

1 21. The chainsaw of claim 20, wherein said metallurgical bond is
2 formed by said coating being at least slightly implanted into a surface of said
3 component.

1 22. The chainsaw of claim 19, wherein said component is a cutter,
2 and further wherein a plurality of cutters are combined with a plurality of
3 means for connecting said plurality of cutters to form said chain.

1 23. The chainsaw of claim 19, wherein said coating includes
2 zirconium nitride.

1 24. The coated chain of claim 19, wherein said coating includes
2 titanium nitride.

1 25. A method for making an extended wear chain comprising the
2 steps of:
3 producing a chain or a chain component; and
4 coating said chain or chain component with one or more of zirconium,
5 titanium, a zirconium compound, and a titanium compound.

1 26. The method of claim 25, wherein said coating is accomplished
2 using a vacuum deposition process.

1 27. The method of claim 26, wherein said vacuum deposition
2 process is a physical vapor deposition process.

1 28. The method of claim 27, wherein said physical vapor deposition
2 process is one of an ion plating, an electron beam gun, a thermal evaporation,
3 a sputtering, a laser ablation, and a cathodic arc process.

1 29. The method of claim 27, wherein said physical vapor deposition
2 process is an ion plating process.

1 30. A method for making an extended wear chain comprising the
2 steps of:
3 placing a chain or a chain component into a vacuum chamber; and
4 coating said chain or chain component with a wear-extending
5 substance by using a vacuum deposition process.

1 31. The method of claim 30, wherein said vacuum deposition
2 process is a physical vapor deposition process.

3 32. The method of claim 31, wherein said physical vapor deposition
4 process is one of an ion plating, an electron beam gun, a thermal evaporation,
5 a sputtering, a laser ablation, and a cathodic arc process.

1 33. The method of claim 31, wherein said physical vapor deposition
2 process is an ion plating process.

3 34. The method of claim 30, wherein said wear-extending substance
4 is one of zirconium, titanium, a zirconium compound, and a titanium
5 compound.

1 35. The method of claim 30, wherein said wear-extending substance
2 is one or both of zirconium nitride and titanium nitride.

1 36. A method for making an extended wear chainsaw chain
2 comprising the steps of:
3 placing a chain cutter into a vacuum chamber; and
4 depositing a layer of one or both of titanium nitride and zirconium
5 nitride on a surface of said cutter by using a physical vapor
6 deposition process, wherein a metallurgical bond is formed
7 between said surface of said cutter and said one or both of
8 titanium nitride and zirconium nitride.

1 37. The method of claim 36, wherein said metallurgical bond is
2 formed by said coating being at least slightly implanted into said surface of
3 said component by said physical vapor deposition process.

1 38. The method of claim 36, wherein said physical vapor deposition
2 process is an ion plating process.

1 39. A method for making an extended wear chainsaw chain
2 comprising the steps of:
3 stamping a plurality of chain components from a raw material;
4 placing some portion of said plurality of chain components into a
5 vacuum chamber; and
6 depositing a layer of one of titanium nitride and zirconium nitride onto
7 surfaces of said some portion of said plurality of chain
8 components by using a physical vapor deposition process,
9 wherein a metallurgical bond is formed between said surfaces
10 and said one of titanium nitride and zirconium nitride.

1 40. The method of claim 39, wherein said metallurgical bond is
2 formed by said coating being at least slightly implanted into said surfaces by

3 said physical vapor deposition process.

1 41. The method of claim 39, wherein said physical vapor deposition
2 process is an ion plating process.

1 42. The method of claim 39, wherein at least one of said some
2 portion of said plurality of chain components undergoing said depositing step
3 is a cutter.

1 43 The method of claim 39, further comprising the step of
2 assembling said plurality of chain components into a closed-loop chain for use
3 in a chainsaw.